Name: _____

Date: _____

Algebra 1B Pd: ____

Unit 3 (Exponents, Scientific Notation, Number Classification) Practice Test

NO CALCULATORS!

Part One: Exponential Simplification: Please simplify each expression COMPLETELY.

1. $(x^2)(x^4)$	2. $-10(a^4)(a^{-3})$
3. $(14g^3h^3k^{90})^0$	4. $(3h^5)^{-2}$
5. $\frac{r^{-3}s^5t^{-3}}{r^5s^{-8}t^5}$	6. $\frac{5a^4b^{-8}c^{12}}{(-a^4b^0c^{-3})^2}$
7. $(-2d^4e^{-9}f^6)(4d^3e^2f^{-1})^2$	8. $\frac{-(x^{-3}y^5z)^{-3}}{(2x^5y^{-8}z^{-2})^3}$

Part Two: Algebraic Sentences: Please answer each question in complete sentences using algebraic terms. Echo the prompt and avoid vague words.

9. What is the difference between multiplying two powers and raising a power to a power? Explain as clearly and concisely as possible. Using a specific example may help your explanation.

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10. When and why might an astronomer use scientific notation?

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11. Explain how you would write five millionths multiplied by ten to the power of negative three in proper scientific notation.

_____

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_____

Part Three: Scientific Notation

12. Write each number in proper scientific notation.

a. 0.0000302 _____

b. 400,000,000,000 _____

c. 22 _____

d. 560×10^{-9} _____

e. 0.045×10^{3} _____

13. Write each number in standard notation.

a. 2.2×10^{-6} _____

b. 4.2×10^{10} _____

c. 7.023×10^{3} _____

d. 1.9×10^{0} _____

e. 3.965×10^{-5} _____

14. Write each number in proper scientific notation. Then, order from least to greatest by writing 1-4 on the smaller lines (1 is the smallest number, 4 the largest).

0.62×10^{-2} _____ _____

620×10^{-7} _____ _____

6.3×10^{0} _____ _____

$6.2x\ 10^{-2}$ _____ _____

15. Simplify. Write each answer in proper scientific notation. Show your work and box your final answers.

a. $5(2 \times 10^{12})$

b. $8(1.2 \times 10^{-4})$

c. $0.5(9.8 \times 10^{-3})$

d. $(5.0 \times 10^{-2})(3.0 \times 10^{-9})$

e. $\dfrac{(6.0 \times 10^{4})}{(18.0 \times 10^{5})}$

f. $\dfrac{(3.0 \times 10^{-3})}{(9.0 \times 10^{-16})}$

Part Four: Word Problems

16. The distance from Earth to Neptune is two billion, seven hundred million miles when both planets line up on the same side of the sun. A spacecraft travels at a speed of nine thousand miles per hour.

a. Write the distance in proper scientific notation. _____

b. Write the speed in proper scientific notation. _____

c. In how many hours would the spacecraft reach Neptune after leaving Earth? Show your work and write your answer in proper scientific notation.

17. A gigabyte is 2.0×10^{30} bytes. If a digital camera has a one hundred twenty eight gigabyte memory card, how many bytes is this? Show your work and write your answer in proper scientific notation.

Part Five: Real Number Classification

18. Classify each number as real, rational, irrational, integer, whole and/or natural. Write all that apply.

a. -20 _____

b. pi _____

c. the square root of seven _____

d. the square root of thirty-six _____

e. ¼ _____

19. Fill in the blanks with ALWAYS, SOMETIMES, or NEVER.

a. A rational number is _____ a real number.

b. The quotient of two non-zero integers is _____ rational.

c. The absolute value of an integer is _____ a whole number.

d. Zero is _____ a natural number.

e. Whole numbers are _____ integers.